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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Lee Daniel Feinberg

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CORVIS CORPORATION  
INTELLECTUAL PROPERTY DEPARTMENT  
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EXAMINER

FERRIS, DERRICK W

ART UNIT

PAPER NUMBER

2663

DATE MAILED: 02/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/917,171	<b>Applicant(s)</b> FEINBERG ET AL.	
	<b>Examiner</b> Derrick W. Ferris	<b>Art Unit</b> 2663	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 July 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-61 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,7-11,13,16-34,36-49 and 59-61 is/are rejected.
- 7) ☒ Claim(s) 3,5,6,12,14,15,35 and 50-58 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>see attached</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1, 4, 8, 9, 11, 13, 16, 17, 18, 20, 24, 26, 27, 29-34, 36, 37, 39, 59 and 60** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,433,904 B1 to *Swanson et al.* ("Swanson") in view of U.S. Patent No. 5,938,309 A to *Taylor*.

As to **claim 1**, see e.g., figures 4 or 7 of *Swanson*. In particular, a first input port is between data source 2, in figure 4, and demux 50. Data source 2 delivers an upgraded data stream at a different rate than say data source 1. Thus a first processing branch is for data source 2 which includes demux 50, FEC coders, WDM transmitters and multiplexer. In particular a demultiplexer for dividing said first data stream into a plurality of third data streams at a third rate which is lower than a first rate is shown as demux 50 since the output of demux 50 is at a lower speed. An FEC unit for adding a forward error correction code to each of said plurality of third data streams to generate FEC encoded data streams is shown as the FEC coders, see e.g., lambda 2 in figure 4. A multiplexer for combining said FEC encoded data streams to output a composite FEC encoded data stream at substantially said first rate is shown as part of the multiplexer. Note that the composite FEC encoded data stream is sent over lambda 2 such that the composite stream is sent at substantially said first rate.

Not clearly shown in figure 4 is a second branch that contains a forward error correction code unit for adding a forward error correction code to each of said plurality of forth data streams to generate FEC encoded data streams.

Examiner proposes to modify the embodiment in figure 4 to include a second branch that teaches the above limitation.

Thus examiner notes that it would have been obvious to one skilled in the art prior to applicant's invention to include the above missing limitation. In particular, one skilled in the art would be motivated to make the proposed modification for the purpose of upgrading more than one data source. As figure 4 shows more than one data source, examiner notes that *Swanson* teaches the above motivation. In addition, *Swanson* also teaches upgrading more than one existing communication system, see e.g., column 3, lines 1-21.

In addition, *Swanson* may not be clear that the multiplexer for combining the FEC encoded data streams outputs an FEC encoded data stream at substantially said first data rate.

*Taylor* teaches the above limitation in combination since e.g., figure 1 clarifies how the optical signals are sent over a WDM link using optical combiner 70 (i.e., multiplexer 16).

Thus examiner proposes to modify *Swanson* to further clarify that the FEC encoded data stream is at substantially said first data rate.

Hence the examiner notes that it would have been obvious to one skilled in the art prior to applicant's invention to include the above limitation at issue. In particular, one

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skilled in the art would have been motivated to make the above motivation for transmitting the information over a lower speed link such as the one shown in figure 1 with respect to OC-48. As such, note that a higher speed link, such as OC-192, is further demultiplexed into lower speed links before being sent over the WDM link where the lower speed links are equivalent to OC-48.

As to **claim 4**, see figure 1 of Taylor where the rates are equal.

As to **claim 8**, the examiner takes Official Notice in that the demultiplexer 50 includes a plurality of demultiplexing stages. In particular, the examiner notes that it is common knowledge to comprise a demultiplexer into a plurality of demultiplexing stages. In particular, the evidence of the record to support the assertion of common knowledge would be that it is common knowledge to build a large demultiplex out of smaller demultiplexers in order to simplify the design and/or to save costs when implementing.

As to **claim 9**, see similar rejection to claim 1. In particular, see e.g., figures 4 and 5 with respect to a receiver instead of a transmitter.

As to **claim 11**, *Swanson* teaches at least two branches. *Taylor* explicitly teaches four branches.

As to **claim 13**, see similar rejection to claim 4.

As to **claim 16**, see similar rejection to claim 8.

As to **claim 17**, see figure 5 of *Swanson* with respect to synchronization.

As to **claim 18**, note that the synchronization units are connected to the FEC.

As to **claim 20**, see similar rejection to claim 1. In particular, see e.g., figure 4 of *Swanson* where a terminal could be data sources and data sinks. A plurality of line units used to amplify the signal are also taught between the terminal units as shown in figure 4. As such, an interface is the DEMUX 50, FEC coder(s), WDM transmitter(s), and MUX which is connected to at least two sources.

Examiner notes that it may not be clear that a first optical data stream is at a first rate and a second optical stream is at a second rate different from the first rate. The examiner note that the data sources are capable of different data rates, see e.g., the abstract, with respect to upgrading. However, assuming the above limitation is not clear, the examiner also notes the obviousness rejection below as well. In particular, *Taylor* teaches the above limitation with respect to e.g., figure 1. In particular, note that the data source rates are different in *Taylor*. *Taylor* also teaches terminal units as e.g., transmitters, line units as amplifiers, and interfaces as the remodulations/optical combiners. As such, the examiner proposes to modify *Swanson* to clarify that different data rates are used. In particular, examiner notes that it would have been obvious to one skilled in the art prior to applicant's invention to use different data rates. One skilled in the art would have been motivated to make the above modification e.g., for the purpose of upgrading the line rates. *Swanson* teaches the above motivation e.g., in the abstract. *Taylor* also teaches a motivation where different transmitters transmit at different line rates as shown e.g., in figure 1.

As to **claim 24**, *Taylor* teaches OC-48 e.g., in figure 1.

As to **claim 26**, see similar rejection to claim 17.

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As to **claim 27**, see similar rejection to claim 18.

As to **claim 29**, see e.g., remodulator 32 in figure 1 of *Taylor*.

As to **claim 30**, see e.g., MUX in figure 4 of *Swanson* or optical combiner 70 in figure 1 of *Taylor*.

As to **claim 31**, both references teach WDM where each channel has a respective data rate (i.e., each channel handles a data rate).

As to **claims 32-33**, figure 1 of *Taylor* shows fixed data rates at e.g., OC-48 and variable data rates e.g., at OC-192 and OC-12.

As to **claim 34**, see similar rejection to claim 1. As such, *Taylor* teaches that the data source in *Swanson* is optical and *Taylor* also teaches that the composite data stream over a second optical channel is at a second data rate, which is different than the first rate.

As to **claim 36**, see similar rejection to claim 17.

As to **claim 37**, one of the principle reasons for using FEC is for transcontinental optical submarine system thus teaching a first optical system and a terrestrial optical system and a second optical system as a submarine optical system.

As to **claim 39**, see similar rejection to claim 7.

As to **claim 59**, see e.g., figure 1 of *Taylor* where a group of OC-48 channels handles an OC-192.

As to **claim 60**, both *Swanson* and *Taylor* teach a same optical fiber. See e.g., figure 4 and 1 respectively.

3. **Claims 2, 10, 21-23, 25, 38, and 40-42** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,433,904 B1 to *Swanson et al.* ("*Swanson*") in view of U.S.

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Patent No. 5,938,309 A to *Taylor* and in further view of “Optical Networking – A Multi-service Global Carrier’s View” to *Afferton*.

As to **claim 2**, *Swanson* and *Taylor* are further silent or deficient to using a second rate of OC-768. In particular, both *Swanson* and *Taylor* teach various SONET rates including OC-192 but do not specifically mention OC-768. *Afferton* teaches OC-768, see e.g., second to last paragraph on page 399. The examiner proposes to modify *Swanson* and *Taylor* to clarify that OC-768 is also a SONET rate. Thus examiner notes that it would have been obvious to one skilled in the art prior to applicant’s invention to further include the above limitation. In particular, one skilled in the art would have been motivated to make the above modification since OC-768 is a known SONET rate. In particular, OC-768 is a further transport rate for SONET.

As to **claim 10**, see similar rejection to claim 2.

As to **claim 21-23**, see similar rejection to claim 2. The references in combination teach different data rates where the different data rates are common SONET rates as is known in the art. These rates include OC-192 and OC-768.

As to **claim 25**, see similar rejection to claim 21-23.

As to **claim 38**, see similar rejection to claim 2.

As to **claim 40**, see combined rejections for claims 9 and 10.

As to **claim 41**, see similar rejection to claim 37.

As to **claim 42**, see similar rejection to claim 17. In particular, the synchronization handles the variable group delay which is based on frame boundaries for each channel, see e.g., column 9, lines 1-8 and column 10, lines 23-41 of *Swanson*.



4. **Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,433,904 B1 to *Swanson et al.* ("*Swanson*") in view of U.S. Patent No. 5,938,309 A to *Taylor* and in further view of "SONET Telecommunications" to *Tektronix*.

As to **claim 7**, *Swanson* and *Taylor* are further silent or deficient to using a second rate of 622 Mbps. In particular, both *Swanson* and *Taylor* teach various SONET rates. *Tektronix* teaches 622 Mbps, see e.g., table 1 on page 2. The examiner proposes to modify *Swanson* and *Taylor* to clarify that 622 Mbps is a known SONET rate. Thus examiner notes that it would have been obvious to one skilled in the art prior to applicant's invention to further include the above limitation. In particular, one skilled in the art would have been motivated to make the above modification since 622 Mbps is a known SONET rate. In particular, 622 Mbps is a further transport rate for SONET.

5. **Claims 19 and 28** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,433,904 B1 to *Swanson et al.* ("*Swanson*") in view of U.S. Patent No. 5,938,309 A to *Taylor* and in further view of "Configurable Logic for Digital Communications: Some Signal Processing Perspectives" to *Dick et al.* ("*Dick*").

As to **claim 19**, *Swanson* and *Taylor* are further silent or deficient to a specific implementation of FPGA and DSP. In particular, *Swanson* teaches implementations in both hardware and software. *Dick* teaches combining DSPs and FPGA. The examiner proposes to modify *Swanson* and *Taylor* to clarify that the hardware and software can be implemented using DSPs and FPGA. Thus examiner notes that it would have been obvious to one skilled in the art prior to applicant's invention to further include the above limitation. In particular, one skilled in the art would have been motivated to make the

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above modification since FGPA-based DSP systems allow the designer to construct signal processing hardware that closely corresponds to the natural data flow of a desired algorithm. In particular, *Dick* teaches the above motivation e.g., in the left-hand column on page 107.

As to **claim 28**, see similar rejection to claim 19.

6. **Claims 43-45 and 61** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,433,904 B1 to *Swanson et al.* ("*Swanson*") in view of U.S. Patent No. 5,938,309 A to *Taylor* and in further view of "Channel Protection in WDM Mesh Networks" to *Gadiraju et al.* ("*Gadiraju*").

As to **claims 43-45**, *Swanson* and *Taylor* are further silent or deficient to a specific implementation of using network protection including mesh network protection, 1+1, or 1:n. *Gadiraju* teaches the above limitation e.g., in the left-hand column on page 26. The examiner proposes to modify *Swanson* and *Taylor* to clarify that network protection schemes include mesh, 1+1, and 1:n are known in the art prior to applicant's invention. Thus examiner notes that it would have been obvious to one skilled in the art prior to applicant's invention to further include the above limitation. In particular, one skilled in the art would have been motivated to make the above modification in order to provide network protection. In particular, *Gadiraju* teaches the above motivation e.g., left-hand column on page 26. In addition, *Gadiraju* also teaches the above limitation for a WDM network.

As to **claim 61**, see e.g., similar rejection to claims 43-45 where *Gadiraju* and teaches many-to-many protection (e.g., M:N protection).

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7. **Claims 46, 48, and 49** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,084,694 A to *Milton et al.* ("*Milton*") in view of U.S. Patent No. 5,938,309 A to *Taylor*.

As to **claim 46**, *Milton* teaches a first set of data streams and a second set of data streams as shown e.g., in figure 9 where node A (i.e., a cross-connect) contains adds/drops two connections at different speeds: Gigabit Ethernet and OC-48. In particular, a node, which includes an optical cross connect, adds/drops "bands" using a primary filter where bands comprise discrete wavelengths and a node further divides the wavelengths into channels using narrow width filters thus providing a multi-level filtering approach, see e.g., column 5, lines 13-25. Thus a band according to figure 9 consists of at least a first and second data rates where the actual rates are further limited using filtering. Also, "selectivity transferring" is based on the type of connection (e.g., Gigabit Ethernet and OC-48) since an optical cross-connect by definition is transparent to particular data rates (i.e., an optical cross-connect by itself cannot distinguish between various data rates). Hence a first branch would be for the Gigabit Ethernet and a second branch would be for the OC-48.

Not clearly taught by *Milton* is a third set of data streams at a third and different rate for the third branch.

*Taylor* teaches the concept of multiple rates such that in combination *Taylor* teaches a third rate and branch. Hence examiner notes that it would have been obvious to one skilled in the art prior to applicant's invention to further teach the above limitation. Examiner notes a motivation for modifying the references would be to support at least

three different types of data connections for each node. Currently each node in figure 9 supports two types of connections. *Taylor* teaches that different transmitters support different connections speeds and teaches at least three different types of speeds (e.g., OC-12, OC-48 and OC-192). Thus *Taylor* provides a motivation. Both references further teach WDM thus creating a reasonable expectation of success for combining the references.

As to **claim 48 and 49**, see similar rejection to claim 46 where *Taylor* teaches OC-48 and OC-192 which are well known SONET rates.

8. **Claim 47** is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,084,694 A to *Milton et al.* ("*Milton*") in view of U.S. Patent No. 5,938,309 A to *Taylor* and in further view of "Optical Networking – A Multi-service Global Carrier's View" to *Afferton*.

As to **claim 47**, see similar rejection to claim 2 where OC-768 is a well known SONET rate.

#### ***Allowable Subject Matter***

9. **Claims 3, 5, 6, 12, 14, 15, 35, 50-54, 55-56, and 57-58** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derrick W. Ferris whose telephone number is (571) 272-3123. The examiner can normally be reached on M-F 9 A.M. - 4:30 P.M. E.S.T.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on (571) 272-3126. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Derrick W. Ferris  
Examiner  
Art Unit 2663

  
DWF

  
Derrick W. Ferris